

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-35 (canceled)

Claim 36 (previously presented): A method of producing a fuel cell, the method comprising the steps of:

providing a first electrode, a second electrode, and a proton conductor layer disposed between the first electrode and the second electrode;

providing a carbonaceous material;

mixing the carbonaceous material having a surface with a solvent comprising a proton conductor material;

coating the surface of the carbonaceous material with the proton conductor material; and

forming at least one of the first electrode and the second electrode with the carbonaceous material.

Claim 37 (previously presented): The method as claimed in claim 36, wherein the proton conductor material comprises a material substantially composed of carbon-based material that forms a matrix structure and at least one type of a proton dissociative group that is attached to the matrix structure.

Claim 38 (previously presented): The method as claimed in claim 37, wherein the carbon-based material is selected from the group consisting of carbon clusters, fullerenes, fullerenes in a sulfonated form, carbon nanotubes including carbon nanotubes in a sulfonated form and mixtures thereof.

Claim 39 (previously presented): The method as claimed in claim 36, wherein the carbonaceous material comprises a carbonaceous material composed of carbon fibers.

Claim 40 (previously presented): The method as claimed in claim 39, wherein the carbonaceous material is selected from the group consisting of at least one type of a carbon nanotube, a graphite fibrous material including a vapor-grown carbon fiber and mixtures thereof.

Claim 41 (new): A gas diffusion electrode operable within a fuel cell comprising a carbonaceous material having a surface and a proton conductor material that is applied to at least a portion of the surface, wherein the proton conductor material is composed of a carbon-based material forming a matrix structure that has at least one proton dissociative group introduced to the matrix structure, wherein the gas diffusion electrode comprises a thickness of about 10 μm or less.

Claim 42 (new): A gas diffusion electrode operable within a fuel cell comprising a carbonaceous material having a surface and a proton conductor material that is applied to at least a portion of the surface, wherein the proton conductor material is composed of a carbon-based material forming a matrix structure that has at least one proton dissociative group introduced to the matrix structure, wherein the gas diffusion electrode comprises a catalyst having a metal component which is applied to at least a portion of the surface of the carbonaceous material.

Claim 43 (new): A fuel cell comprising:
a first electrode, a second electrode and a proton conductor layer disposed between the first electrode and the second electrode, wherein at least one of the first electrode and the second electrode comprises a carbonaceous material having a surface and a proton conductor material that is applied to at least a portion of the surface, wherein the first electrode and the second electrode each comprise a thickness of about 10 μm or less.

Claim 44 (new): A fuel cell comprising:

a first electrode, a second electrode and a proton conductor layer disposed between the first electrode and the second electrode, wherein at least one of the first electrode and the second electrode comprises a carbonaceous material having a surface and a proton conductor material that is applied to at least a portion of the surface, wherein the first electrode and the second electrode each comprise a catalyst having a metal component which is applied to at least a portion of the surface of the carbonaceous material.

Claim 45 (new): A fuel cell comprising:

a first electrode, a second electrode and a proton conductor layer disposed between the first electrode and the second electrode, wherein the first electrode and the second electrode each comprise a fibrous carbonaceous material and a proton conductor material that is applied to at least a portion of the fibrous carbonaceous material, wherein the first electrode and the second electrode each comprise a thickness of about 10 μm or less.

Claim 46 (new): A fuel cell comprising:

a first electrode, a second electrode and a proton conductor layer disposed between the first electrode and the second electrode, wherein the first electrode and the second electrode each comprise a fibrous carbonaceous material and a proton conductor material that is applied to at least a portion of the fibrous carbonaceous material, wherein the first electrode and the second electrode each comprise a catalyst having a metal component which is applied to at least a portion of the fibrous carbonaceous material.